Nonuniformity of the zonal flow on the turbulent transport

C.-B. Kim¹, C.-Y. An¹, B. Min¹

¹ Soongsil University, Seoul, Korea

Fluctuation and the turbulent transport flux in the numerical simulations of a toy model of the drift turbulence are found to show different characteristics on the dependence of the nonuniformity of the zonal flow. The results suggest that depending on the degree of the adiabaticity of the electrons the flow shear may not be a deciding factor on the intensity of the turbulence. For instance, at near adiabatic situation the turbulence is found localized in a narrow shear layer around where the zonal flow is fastest along the direction of the electron diamagnetic drift. Instead of following the conventional wisdom of the zonal-flow shearing suppressing the turbulence, it resembles the strong correlation of the turbulence with the curvature of the flow as reported in the works of the tokamak plasma transport barrier [1, 2]. Physics behind the details of the impact of the nonuniformity of the flow will be presented and possible extensions to the study of the formation of the transport barrier by the zonal flow will be discussed at the conference.

References